## REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-2, 5-7, 9-10 and 12-18 are presently pending in this application, Claims 15-18 added by way of the present amendment.

In the outstanding Office Action, Claims 1-3, 6, 13 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent 6,984,253) in view of Pitcher, Jr. (U.S. Patent 4,329,162) in view of Takahashi et al. (U.S. Patent 6,261,982) in view of Park et al. (U.S. Patent 6,214,227); Claims 4 and 7-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al., Pitcher, Jr., Takahashi, et al. and Park et al., and further in view of Shimoda et al. (U.S. Patent 5,725,618); Claims 5 and 10-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al., Pitcher, Jr. Takahashi, et al. and Park et al.and further in view of Merry (U.S. Patent 5,171,341).

### I. Traversal of Rejected Claims (Without Amendment) to Preclude New Grounds of Rejection in a Final Action

Applicants respectfully submit that pending Claims 1-2, 5-7, 9-10 and 12-14 are patentable (without amendment) over the cited references for the reasons discussed below. As such, this response cannot "necessitate a new grounds of rejection," and a forthcoming Office Action including new grounds of rejection for *any* of these unamended claims cannot be properly made final. While Applicants believe that the remarks provided herein should result in allowance of the claims in their present form, the Examiner is requested to contact the undersigned Attorney of Record, Ed Garlepp, at (703) 412-5920, to discuss amendments deemed necessary by the Examiner to clarify the arguments presented herein. For example, Applicants submit that dependent Claims 2 and 15-18, (some being newly added) further

distinguish over the cited references; Applicants would consider combining any of these claims with a base claim in order to further prosecution in this case.

**II. The Cited References do not Disclose or Render Obvious the Range of Claims 1 or 2**

Turning now to the merits, Applicants' invention is directed to a honeycomb filter for purifying exhaust gas. As discussed in the Background portion of Applicants specification, such filters have conventionally been problematic in that porosity requirements may diminish the strength of the filter such that cracks can develop around the sealing plugs of the filter. Having recognized this problem, the inventors conducted experiments to determine parameters relating to the diminished strength, which are summarized in Tables 1 and 2 of the specification. Based on these experiments, the inventors discovered that a relationship between the three-point bending strength and the length of the plugs can improve resistance to cracking, without excessive diminishing of the porosity and plug requirements. Applicants claimed invention is directed to this feature.

Specifically, Claim 1 recites "wherein the columnar body has a three-point bending strength Fα (MPa) measured in accordance with JISR1601, the plurality of plugs has a length L (mm) in the length direction, and the columnar body and the plurality of plugs are formed such that the three-point bending strength Fα (MPa) and the length L (mm) are adjusted to satisfy the relationship of $F\alpha \times L \geq 30$." Claim 2 further recites the relationship of "$30 \leq F\alpha \times L \leq 200$." As discussed in Applicants' specification, by providing the columnar body and plugs as such (*i.e.*, a columnar body with a lower three point-bending strength can be prevented from cracking by making plugs longer, and a columnar body with a higher three-point bending strength can be prevented from cracking simply by using shorter plugs), the wall portion of the columnar body is substantially prevented from cracking caused by, for

example, vibrations from an automobile, the impact during installation, and the impact of exhaust gas pressure.

The Office Action admits that Ichikawa et al. does not teach or suggest these claimed ranges, but cites Pitcher, Jr., Park et al. and Takahashi et al. as correcting this deficiency. First, the Office Action takes the position that Ichikawa et al. would be modified to include the three-point bending strength feature of Park et al. and also to include the plug length feature of Pitcher. However, as discussed above, it is the present inventors who discovered the importance of the ***relationship*** of these features to reducing cracking of a wall portion of a columnar body. There is no hint of this relationship in any of the cited references, and therefore, the rejection of Claim 1 amounts to impermissible hindsight reasoning.

Moreover, Park et al. discloses that the three-point bending strength is more than 100MPa, which when considered in relation to the length of plugs in Pitcher would provide a minimum value of $F\alpha \times L$ to be $100 \times 9.5 = 950$. This value greatly exceeds the minimum claimed value of 30 recited in Claim 1. Thus, even when the independent features of Park et al. and Pitcher are combined with Ichikawa et al., the combination does not teach or suggest the range presented in the amended Claim 1.

The Office Action takes the position that the three-point bending strength is also disclosed in Takahashi. However, Takahashi does not provide details of the three-point bending strength test conditions. In particular, Takahashi only discloses the size of the specimen being 11.5mm× 22mm, and it is unclear which side of tubular body is used to prepare the specimen. Moreover, Takahashi does not indicate whether or not the convex side is facing up when specimen was measured. Although Takahashi indicates a 40mm span distance, Applicants submit that such distance cannot be measures regardless of the direction in which the specimen faces. Thus, Takahashi does not disclose sufficient testing conditions for three-point bending strength to read on the claimed range.

Perhaps more importantly, the three-point bending strength in Takahashi appears to be completely different from the measurement target of the claimed invention. Takahashi discloses a plurality porous ceramic tubular bodies (see col. 4 lines 39-42) used to "remove the dust in high-temperature gas exhausted from pressure fluidized-bed boiler, coal gasification furnace, and incinerators etc." (see col.1 lines 4-7). Thus, it is initially noted that the ceramic structure of Takahashi is quite different from the present invention. Moreover, the three-point bending strength in Takahashi is measured using a specimen that is prepared by cutting a portion from a baked tubular body[1] having an external diameter 170mm, internal diameter 140mm, and length 850mm (see col.4 lines 39-42 and col. 5 lines 1-5).[2] That is, the strength measured in Takahashi is that is a plurality porous ceramic member that are ***not honeycomb-shaped***. In this regard, the thickness of the specimen is presumed to be 15 mm given the length of external diameter and internal diameter [(170-140)/2]. The attached Figures A-1 and A-2 shows a possible measurement of the three-point bending strength in Takahashi. While Takahashi does not indicate which direction the specimen faces during the test, it can be estimated that the measurement takes place in a flat-shape of the plurality porous ceramic members, which is a 15mm thick side in Figures A-1 and A-2.

In contrast, the measurement technique of the presently disclosed invention measures the three-point bending strength using a specimen from a plurality of honeycomb-shaped porous ceramic members. As shown in Figure 3(a) of Applicants' specification, the specimen extends perpendicular in a length direction of the through holes 11 and is approximately 34mm X 34mm. Further, the specimen is made by cutting a prismatic sample (Figure 3 (a)) along the internal wall of the through holes 11 of the honeycomb filter as shown in Figure 1 (see also paragraph [0044] in the specification). That is, in order to make

[1] This is also disclosed in the priority document at paragraph [0021]
[2] This is also disclosed in the priority document at paragraph [0024]

honeycomb filter illustrated in Figure 2, a plurality porous ceramic members (Figure 3 (a) is made in a manufacturing process which is used as specimen.

The attached Figures B-1 and B-2 show a picture of a measurement technique for the three-point bending strength parameter of the present invention. The plurality of porous ceramic members (30) used for the measurement provide many through holes. For instance, in example 1 there are 31 though holes (1 square centimeter each), and the through holes have wall portions (33), which are 0.3mm thick respectively. That is, there are more open spaces than ceramic parts on the surface perpendicular to a long direction of a plurality porous ceramic member.

As is clear from the above description, the evaluation result is clearly different when a honeycomb-shaped specimen having a plurality porous ceramic members (illustrated in Figure B-1), and when a flat-shaped specimen composing a plurality porous ceramic members (illustrated in Figure A-1) is used to measure the three-point bending strength. That is, when a flat-shaped specimen shown in Figure A-1 is used, a material of a plurality porous ceramic members is measured in strength, while when a honeycomb shaped specimen in Figure B-1 is used to measure the strength, including density of though hole, size of though hole, and thickness of a wall portion.

Thus, based on the test results of three-point bending strength in Takahashi, it is essentially impossible to conclude that Takahashi discloses the value of Fα that is used to obtain the parameter claimed in this application. Also, the use of both the bending strength of Takahashi and the length of plugs of Pitcher is not suitable. This provides an additional distinction over the cited references.

For the reasons discussed above, Ichikawa et al., Pitcher, Jr., Takahashi et al. and Park et al. do not, either alone or in combination, disclose the bending strength Fα (MPa) and the length L (mm) adjusted to satisfy the cited relationship as recited in Claim 1. Further,

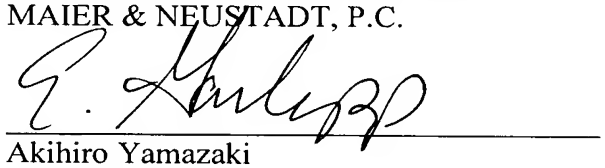
Shimoda et al. and Merry are cited for teachings of the dependent claims and do not correct the deficiencies noted above.

For the foregoing reasons, Claim 1 is believed to be allowable. Furthermore, since Claims 2-18 depend directly or indirectly from Claim 1, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 2-14 are believed to be allowable as well. Nevertheless, Claims 15-18 are added herein to further distinguish over the cited references. These amendments are believed to find support in the specification, claims and drawings as originally filed and no new matter is believed to be added thereby.

In view of the amendments and discussions presented above, Applicant respectfully submits that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Akihiro Yamazaki
Attorney of Record
Registration No. 46,155

Edwin D. Garlepp
Registration No. 45,330

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)

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FIG. A-1

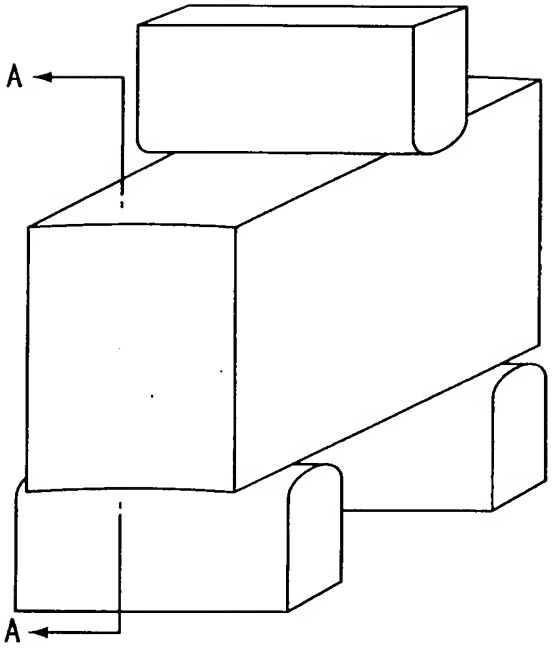
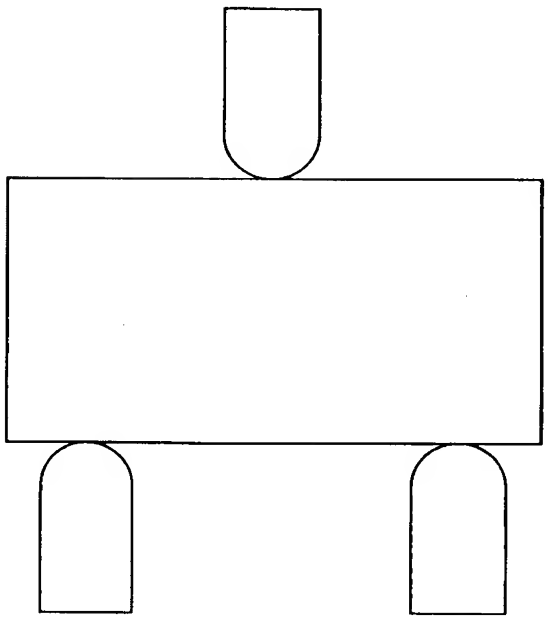



FIG. A-2



A-A line cross-sectional view

FIG. B-1

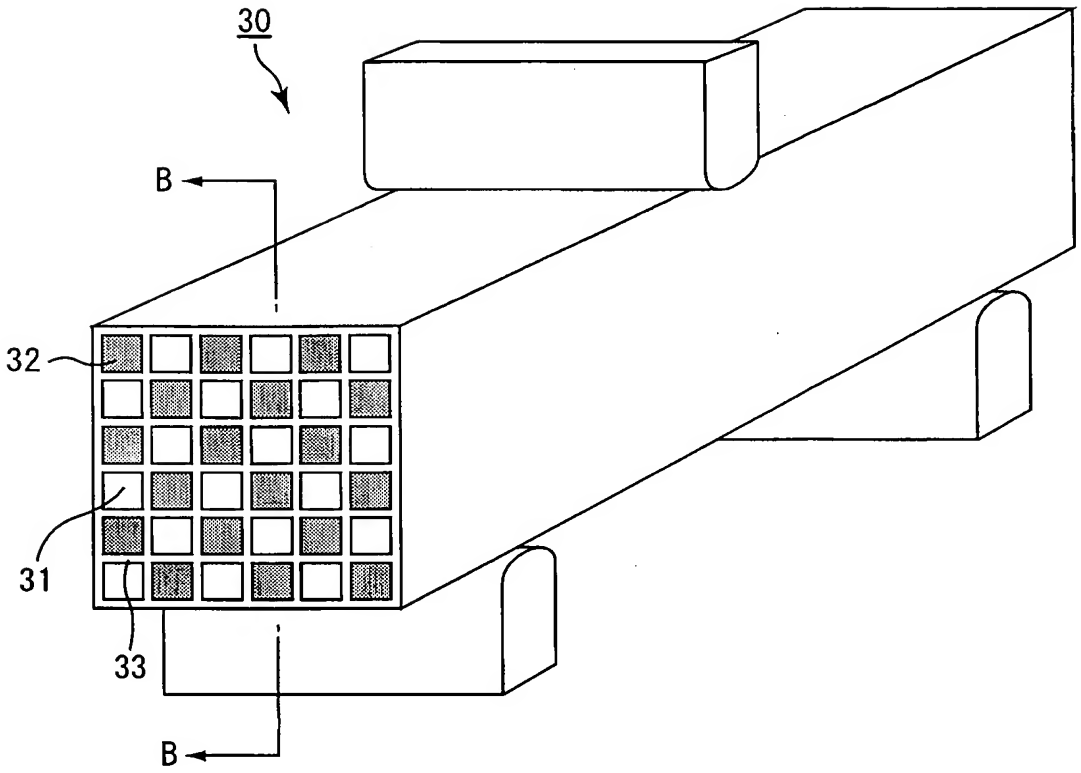
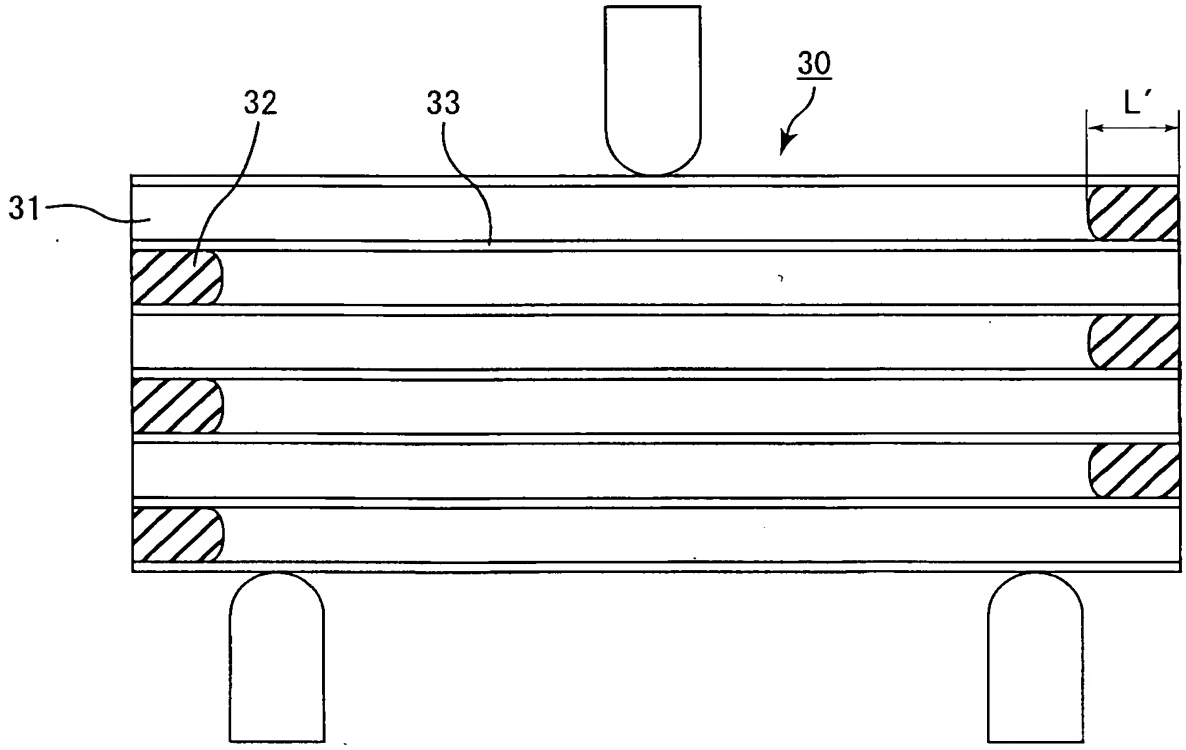



FIG. B-2




B-B line cross-sectional view